

PATENT SPECIFICATION (11)

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DRAWINGS ATTACHED

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(19)



(54) AN IMPROVED SHEDDING MOTION

(71) We, JOHN DALTON GRIFFITH, a British subject of 59 Havenbault Avenue, Littleover, Derby, Derbyshire, and BONAS MACHINE COMPANY LIMITED, a British company of Grangewood Hall, Netherseal, Near Burton-on-Trent, Staffs., do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention concerns narrow-fabric weaving looms, and in particular, though not exclusively, a shedding motion for such looms.

It is known in some loom constructions for heald shafts to be operated by levers which are held each in contact with the surface of a co-operating cam by means of tension springs located at or near to the extremity of the lever to which the heald shaft is connected. Such an arrangement, whilst being effective, has the disadvantage that the positioning of the spring is such that, in use its amplitude of movement will be relatively large and thus the springs to have a long operative life must be of sturdy construction, and thus comparatively heavy form and this leads to the creation of high inertia forces which tend to limit the speed of operation of the loom to a value lower than that which, in narrow fabric looms in particular, is desirable.

It is the object of the present invention to provide a shedding motion which will overcome or at least substantially mitigate the above outlined disadvantages and thus enable the loom to operate at the very high speed demanded by the present-day looms.

According to the present invention there is provided a loom shedding motion characterised in that a heald shaft is linked to a pivotal lever arranged to be driven in one directional sense by the action of a co-operating cam means acting upon a follower carried by the lever, and in the opposed directional sense by the action of a compression spring, there being a push rod between the spring and the pivotal lever.

The invention will now be described further by way of example only, with reference to the drawings accompanying the Provisional specification, in which:—

Figure 1 is a schematic side elevation of a loom including a shedding motion according to one form of the invention;

Figure 2 is a detail view on a larger scale of a second form of shedding motion, and

Figure 3 illustrates diagrammatically a heald frame and its manner of mounting in a loom.

Whilst the drawings and following description relate to a narrow fabric loom it is to be understood that the shedding motion may be applied to a loom of the kind used for weaving broad fabrics.

As shown in the drawings and in particular Figure 3 there is provided a heald frame 10 whose vertically disposed elements 10a are constrained laterally by short guide blocks 13 mounted on slide elements 18 which guide the frame in its vertical movement and restrain the frame against fore and aft movement. The slide elements 18 are mounted on the loom frame 14. The guide blocks 13 are, as shown located between upper and lower heald bars 15 and thus must be short enough to allow for unrestricted vertical movement of the heald frame 10 between upper and lower shed positions. A connecting rod 12 is rigidly attached at its upper end to heald frame 10 and pivotally connected in the transverse plane at its lower end to the extremity 16 of one arm 17 of a pivotal lever 17a. The connecting rod 12 has sufficient inherent flexibility to accommodate for the arcuate displacement of the lever extremity 16 when the loom is in use. The pivotal lever 17a has as its fulcrum a pivot shaft 11 and extending from this fulcrum in a direction opposite to arm 17 is a short arm 17b provided at its end with a cam follower 19 in the form of, for example a roller. The follower member 19 is caused as shown in Figure 2 to make contact with the surface of a co-operating cam 20 mounted on a

camshaft 21 journaled in the loom frame 14 and driven at an appropriate speed from the loom main shaft (not shown). The contact of follower 19 with cam 20 is maintained by use of a compression spring 22 acting on the arm 17 of pivotal lever 17a at close proximity to pivot shaft 11. Compression spring 22 is guided and provided with a re-action face by a cylinder 24 mounted on the loom frame 14. A slidable piston 25 abuts the free end of the compression spring 22 and is provided with a push rod 26 having part-spherical ends 26a which are seated in mating spherical depressions 27 formed in both the piston 25 and the arm 17. The cam follower 19 is positioned close to the pivot shaft 11 and the compression spring 22 is positioned to act upon the pivot arm 17 at a distance from the shaft 11 not exceeding the distance of the cam follower axis from the pivot shaft 11 and because of this arrangement the moment of inertia of the pivotal lever 17a about its fulcrum will thereby be kept to a low value, as will the bending moment which will be induced upon the arm 17 of the pivotal lever 17a only by the load derived from moving the heald frame mass and not by the force of the compression spring 22 and hence the proportions and thus the mass of this arm 17 can advantageously be somewhat less than is the case in known looms. Furthermore, the oscillations of the compression spring 22 will be of small amplitude due to the proximity of the spring to the fulcrum of lever 17a as will be the movement of the piston 25 and push rod 26 thereby keeping to a low value the inertia force deriving from these components and thus enabling very high operating speeds to be achieved.

As indicated in Figure 1 the cam 20 may be replaced by a chain 28 the links of which are so formed as to produce a cam surface so that large pattern repeats can be achieved.

The invention is not restricted to the details set out above. For example, the disposition of the follower 19 and spring 22 relative to the pivot shaft 11 can be altered to give the same effect. Details of such modifications will suggest themselves to persons skilled in the art of loom construction and thus it is not thought to be necessary to set these out in detail in this specification.

WHAT WE CLAIM IS:—

1. A loom shedding motion character-

ised in that a heald shaft is linked to a pivotal lever arranged to be driven in one directional sense by the action of a co-operating cam means acting upon a follower carried by the lever, and in the opposed directional sense by the action of a compression spring, there being a push rod between the spring rod and the pivotal lever.

2. A loom shedding motion as claimed in claim 1 in which the follower and the compression spring are positioned on opposite sides of a fulcrum for said pivotal lever.

3. A loom shedding motion as claimed in claim 2 in which the follower and the compression spring are positioned close to the fulcrum of said pivotal lever with the spring positioned to act on the lever at a distance from the pivot shaft not exceeding the distance between the follower axis and the pivot shaft.

4. A loom shedding motion as claimed in any one of the preceding claims, in which said compression spring is mounted within a cylinder which is closed at one end, there being a piston within the cylinder and a push rod between the piston and said pivotal lever.

5. A loom shedding motion as claimed in claim 4 in which the push rod is provided with part spherical ends seated respectively in corresponding receiving formations in said piston and said pivotal lever.

6. A loom shedding motion as claimed in claim 1 in which said pivotal lever is connected to a connecting rod which latter, is secured to a heald frame, said heald frame being associated with means whereby it is constrained from lateral movement.

7. A loom shedding motion as claimed in claim 6 in which the means for constraining the heald frame comprise guide blocks mounted between spaced heald receiving bars, said blocks being themselves mounted upon heald frame guide means, the latter serving to constrain the frame in a fore and aft direction and being of such dimensions that a heald frame is retained between the said guide means throughout its entire range of movement.

8. A loom shedding motion substantially as hereinbefore described with reference to and as illustrated in the drawings accompanying the Provisional Specification.

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